# Debugging in SPIM

CMPUT 229

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# Outline

**1** **Debugging Programs**

**2** **SPIM Debugging Features**

**3** **Example**

# How Do You Debug?

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- Breakpoints
- Single-stepping
- Inspecting variable values

# Breakpoints in SPIM

- Can only set breakpoints by address or global symbol name.
  - You can make symbols in your program global using the `.globl` directive.
- Look up the address of the instruction you want to break on in the `Text Segments` pane in QTSPIM.
- See all the global symbols by choosing `global symbols` in the `print` menu in QTSPIM.
- Use the `p(rint)` command to show instructions in SPIM.
- Use the `print_symbols` command to show global symbols in SPIM.
- Set a breakpoint by right clicking on the instruction QTSPIM, or the `breakpoint` command in SPIM.

# Stepping in SPIM

- Click the "Single Step" button in QTSPIM.
- Use the s(tep) command in SPIM.
    - Just hit enter to repeat the last command – handy when single-stepping.

# Value Inspection in SPIM

- As you know, there aren't really variables in assembly language.
- There are registers, and memory, where we keep values.
- In QTSPIM, the registers are listed in the left pane, and values in memory can be found in the `Data Segments` pane.
- In SPIM, use the `p(rint)` command to print values in registers or memory.

# Example

- A simple program to calculate and display the Fibonacci sequence.
- But it doesn't quite work ...

# Questions?